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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,527	12/08/2003	Junaid Ahmed Siddiqui	06354ZP USA	2963
23543 7590 03/30/2007 AIR PRODUCTS AND CHEMICALS, INC. PATENT DEPARTMENT 7201 HAMILTON BOULEVARD ALLENTOWN, PA 181951501			EXAMINER MARCHESCHI, MICHAEL A	
			ART UNIT 1755	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/30/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary	Application No. 10/730,527	Applicant(s) SIDDIQUI, JUNAID AHMED	
	Examiner Michael A. Marcheschi	Art Unit 1755	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-34 (claims renumbered in view of the two claim 32's) is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-34 (claims renumbered in view of the two claim 32's) is/are rejected.
- 7) ☒ Claim(s) 23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

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It is to be noted that the amendment filed 1/8/07 contains two claim number 32's and thus this should be taken into consideration when the claim are amended in applicants response. It is suggested that these claims be rewritten as new claim numbers.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/8/07 has been entered.

Claims 19-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 is indefinite as to the limitation "high rate" because the term "high" renders the phrase indefinite. The term "high" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. What does "high" encompass?

Claims 19 and 32 are indefinite as to the limitation "providing a substrate having a surface and a polish pad" because this limitation is not defined in a clear and concise manner.

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The way it is drafted implies that the substrate has a polishing pad (thereon) which is clearly not the case. The substrate is brought into contact with the polishing pad, however, the above limitation does not clearly define this. In view of this, the above limitation should be reworded.

Claim 32 (second claim 32) is indefinite because it depends on claim 33.

Claim 33 is indefinite because it depends on itself.

The other claims are indefinite because they depend on an indefinite claim.

Claim 21 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for removal rates of 3707 and 3983 (literal values) defined in the table for a composition that contains STYRON OX-K abrasive, ammonium fluoride and the specific SURFYNOL surfactant, does not reasonably provide enablement for a removal rate of at least 3707 coupled with the broad composition as claimed (no specific components defined consistent with those defined in the table). The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with this claim.

Claim 21 claims a removal rate for the broad composition, as defined in claim 19. This encompasses the claimed removal rate for a composition comprising any abrasive, any fluoride salt and any acetylenic alcohol. However, the specification only teaches the use of specific components in the slurry to provide the claimed removal rate. Such a limited disclosure does not support the breadth of the instant claim.

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Claim 21 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for removal rates of 3707 and 3983 (literal values) defined in the table does not reasonably provide enablement for a removal rate of at least 3707, as claimed. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with this claim.

Claim 21 claims a removal rate of at least 3707. Since this claim defines no upper limit for the removal rate and the specification removal rates are defined as 3707 and 3983, the specification does not enable the breadth of the instant claim.

Claim 22 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a fluoride salt amount of about 0.005 (section 0014 of the original specification) does not reasonably provide enablement for a fluoride amount of about 0.004, as claimed. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with this claim.

Applicant states that the examples support this. The examiner disagrees because any calculation of the amount does not clearly support this. In addition, the amount defined by claim 22 is in contradiction with what is defined in section 0014 of the original specification.

Claim 23 is objected to because of the following informalities:

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Claim 23 is objected to because the phrase "consist a film" should be "consists of a film".
Appropriate correction is required.

In view of the amendment filed 1/8/07 containing two claim number 32's, for the purpose of rejecting the claims over art, the second claim 32 is viewed as claim 33 and claim 33 is viewed as claim 34.

Claim 32 is rejected under 35 U.S.C. 103(a) as obvious over Streinz et al. (686) in view of Moeggenborg et al. (762).

Streinz et al. teach in the abstract, column 4, line 25-column 7, line 60, a polishing composition which comprises an abrasive (silica), a fluoride salt (ammonium fluoride) and a surfactant. The composition is used to polish substrates that contain dielectrics by contacting the surface of the substrate with a polishing pad.

Moeggenborg et al. teaches in column 6, last three lines of section [0047], that the claimed specific diol is a known (nonionic) surfactant to be used with colloidal abrasive (silica) to make a polishing composition.

The primary reference teaches a composition that contains the claimed components a) and b). With respect to claimed component "c)", the primary reference teaches that a surfactant can be added (surfactant is not limited and can be a nonionic surfactant). The claimed diol is a well known nonionic surfactant (to be used with colloidal abrasive to make a polishing composition), as is clearly shown by the secondary reference and therefore the use thereof is well within the level of ordinary skill in the art because the primary reference implies that any

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nonionic surfactant can be used. This implication, as defined by the primary reference, provides the necessary motivation for the combination, as applied. The use of any nonionic surfactant is obvious to the skilled artisan, especially known nonionic surfactants, as shown by the secondary reference. The examiner acknowledges that the teaching of the secondary reference is a comparative example, however, since a reference can be used for all it teaches, this surfactant is known, irrespective of it being defined in a comparative example.

Claims 19-22, 25-30 and 32 are rejected under 35 U.S.C. 103(a) as obvious over Mirsa et al. in view of Moeggenborg et al. (762).

Misra et al. teach in column 3, lines 30-57 and column 5, line 25-column 6, line 35, a polishing composition which comprises 2-50% of an abrasive (colloidal silica), about 0.1% of ammonium fluoride and a surfactant. An example of a surfactant is of the SURFYNOL type (i.e. nonionic surfactant). The composition is used to polish substrates that contain silicon oxide/silicon nitride by contacting the surface of the substrate with a polishing pad.

The primary reference teaches a composition that contains the claimed components a) and b). With respect to claimed component "c)", the primary reference teaches that a surfactant can be added (an example of a surfactant is defined and this being a nonionic surfactant-SURFYNOL type). The claimed diol is a well known nonionic surfactant (to be used with colloidal abrasive to make a polishing composition), as is clearly shown by the secondary reference and therefore the use thereof is well within the level of ordinary skill in the art because the primary reference implies that any type of SURFYNOL (nonionic surfactants) can be used (i.e. the reference is not limited to the specific nonionic surfactant defined because this is a mere

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example). This implication, as defined by the primary reference, provides the necessary motivation for the combination, as applied. The use of any nonionic surfactant is obvious to the skilled artisan, especially known SURFYNOL (nonionic) surfactants, as shown by the secondary references. In addition, and assuming *arguendo* about the surfactant defined by the primary reference, the substitution of one known SURFYNOL (nonionic) surfactant for another is well within the level of ordinary skill in the art. In view of this, the use of any nonionic SURFYNOL surfactant is well within the level of ordinary skill in the art. The examiner acknowledges that the teaching of the secondary reference is a comparative example, however, since a reference can be used for all it teaches, this surfactant is known, irrespective of it being defined in a comparative example. With respect to the amount of surfactant, one skilled in the art would have appreciated the amount need to optimize the slurry in terms of the wettability, said amounts being conventional in the art, as shown by the secondary reference. Although the amount of fluoride defined by the primary reference is not literally the value of claim 22, this is still obvious because both the primary reference and the claim defines the amount in terms of "about" and about permits some tolerance. *In re Ayers*, 154 F 2d 182, 69 USPQ 109. With respect to the removal rate, since the composition is the same and is used to polish the same material (dielectric), it can be expected that the composition will provide the same removal rate of the dielectric because the same composition is expected to yield the same results. With respect to claim 26, the primary reference polishes silicon dioxide and it is known that silicon dioxide is formed from PETEOS, as shown by the secondary reference in example 2, thus this limitation would have been appreciated by the skilled artisan.

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Claims 19-22, 26-30 and 32 are rejected under 35 U.S.C. 103(a) as obvious over Pasqualoni et al. (913) in view of Moeggenborg et al. (762).

Pasqualoni et al. teach in column 4, line 29, column 4, line 65-column 5, line 1 and column 5, line 39, a polishing composition which comprises 0.5-40% of an abrasive (colloidal silica), about 0.01% of a fluoride salt and the claimed amount of surfactant. The composition is used to polish substrates that contain silicon oxide/silicon nitride by contacting the surface of the substrate with a polishing pad. The composition is used to polish substrates that contain dielectrics (silicon dioxide as implied by the teaching of column 1, lines 4-5 and column 1, lines 17-19) by contacting the surface of the substrate with a polishing pad.

The primary reference teaches a composition that contains the claimed components a) and b). With respect to claimed component "c)", the primary reference teaches that a surfactant can be added (surfactant is not limited and can be a nonionic surfactant). The claimed diol is a well known nonionic surfactant (to be used with colloidal abrasive to make a polishing composition), as is clearly shown by the secondary reference and therefore the use thereof is well within the level of ordinary skill in the art because the primary reference implies that any nonionic surfactant can be used. This implication, as defined by the primary reference, provides the necessary motivation for the combination, as applied. The use of any nonionic surfactant is obvious to the skilled artisan, especially known nonionic surfactants, as shown by the secondary reference. The examiner acknowledges that the teaching of the secondary reference is a comparative example, however, since a reference can be used for all it teaches, this surfactant is known, irrespective of it being defined in a comparative example. Although the amount of fluoride defined by the primary reference is not literally the value of claim 22, this is still

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obvious because both the primary reference and the claim defines the amount in terms of "about" and about permits some tolerance. *In re Ayers*, 154 F 2d 182, 69 USPQ 109. With respect to the removal rate, since the composition is the same and is used to polish the same material (dielectric), it can be expected that the composition will provide the same removal rate of the dielectric because the same composition is expected to yield the same results. With respect to claim 26, the primary reference polishes silicon dioxide and it is known that silicon dioxide is formed from PETEOS, as shown by the secondary reference in example 2, thus this limitation would have been appreciated by the skilled artisan.

The examiner acknowledges that all the primary references, above, disclose additional components, however, the transitional phrase "consisting essentially of" only limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristic(s)" of the claimed invention. *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976). It is therefore the examiners position that the reference teachings are still within the scope of "consisting essentially of" because it is the examiners position that said additional components would not materially affect the basic and novel characteristic(s)" of the claimed invention. Applicant has the burden of showing that the introduction of additional components would materially change the characteristics of applicant's invention.

Claims 19-24 and 26-34 are rejected under 35 U.S.C. 103(a) as obvious over Fang et al. (817) in view of Moeggenborg et al. (762).

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Fang et al. teach in column 2, line 35-column 3, line 98, and column 4, line 31-column 6, line 56, a polishing composition which comprises 0.1-40% total solids of an abrasive (with 95% being colloidal silica), a fluoride salt, as is evident from column 4, line 65 coupled with column 5, line 48 (any amount can be used but desirably present at a minimum amount of about 0.01%) and a surfactant. The composition is used to polish substrates that contain dielectrics (silicon dioxide-removing silicon dioxide at a high rate). No oxidizer needs to be present.

The primary reference teaches a composition that contains the claimed components a) and b). With respect to claimed component "c)", the primary reference teaches that a surfactant can be added (surfactant is not limited and can be a nonionic surfactant). The claimed diol is a well known nonionic surfactant (to be used with colloidal abrasive to make a polishing composition), as is clearly shown by the secondary reference and therefore the use thereof is well within the level of ordinary skill in the art because the primary reference implies that any nonionic surfactant can be used. This implication, as defined by the primary reference, provides the necessary motivation for the combination, as applied. The use of any nonionic surfactant is obvious to the skilled artisan, especially known nonionic surfactants, as shown by the secondary reference. With respect to the amount of surfactant, one skilled in the art would have appreciated the amount need to optimize the slurry in terms of the wettability, said amounts being conventional in the art, as shown by the secondary reference. With respect to the amount of fluoride salt, Fang et al. teaches that this component is used in any amount but desirably present at a minimum amount of about 0.01%. The literal amount defined by this reference reads on the amount defined by instant claim 20. Although the amount of fluoride defined by the primary reference is not literally the value of claim 22, this is still obvious because both the

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primary reference and the claim defines the amount in terms of “about” and about permits some tolerance. *In re Ayers*, 154 F 2d 182, 69 USPQ 109. In the alternative, Fang et al. teaches that any amount can be added and the desirable limitation (0.01%) can be viewed as a preferred amount. Since a reference is not limited to the preferred embodiments, it can be reasonably concluded that the statement “any amount” encompasses values less than the desired amount stated by the reference, thus broadly encompasses the claimed amount. With respect to the removal rate, since the composition is the same and is used to polish the same material (dielectric), it can be expected that the composition will provide the same removal rate of the dielectric because the same composition is expected to yield the same results. With respect to claim 26, the primary reference polishes silicon dioxide and it is known that silicon dioxide is formed from PETEOS, as shown by the secondary reference in example 2, thus this limitation would have been appreciated by the skilled artisan. With respect to claim 24, the primary reference teaches in column 6, lines 61-62 that low dielectric films can be polished and this broadly encompasses the claimed limitation.

Applicant's arguments filed 1/8/07 have been fully considered but they are not persuasive.

On the onset of the response, applicant states that an oxide CMP is different from a metal CMP. The examiner acknowledges this, but for the reasons defined below, the previously applied references teach the claimed invention.

With respect to the rejection based on Streinz/Moeggenborg, applicant argues that Streinz is not related to a “high” planarization rate of the oxide (dielectric), as claimed in claims 19 and

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21 but rather teaches a low planarization rate of the dielectric (see column 3, lines 31-32 of the reference). The examiner acknowledges this and has dropped the rejection on the claims directed to a high polishing rate. However, Streinz/Moeggenborg is still applicable to claim 32 because this claim does not mention the planarization rate. Applicant admits that this Streinz teaches polishing a dielectric film. The only substantial argument to the second independent claim (first claim number 32 as defined in the amended version of the claims) is that Streinz uses an oxidizer which is outside the scope of the instant claims (consisting essentially of). The examiner disagrees because it is the examiners position that the reference teachings are still within the scope of "consisting essentially of" because it is the examiners position that said additional components would not materially affect the basic and novel characteristic(s) of the claimed invention. Applicant has the burden of showing that the introduction of additional components would materially change the characteristics of applicant's invention.

With respect to the rejection based on Pasqualoni/Moeggenborg, applicant argues that the proposed combination would not result in the claimed high removal rate, as claimed in claims 19 and 21. Applicant refers to figure 2 of Pasqualoni and the examples of Moeggenborg. First, Pasqualoni does not have a figure 2 and second, a reference is not limited to the disclosure in the examples (or figures) but rather can be used for all it realistically teaches. The examiner has clearly made a prima facie case of obvious for the combination of components and stated that since the composition is the same and is used to polish the same material (dielectric), the claimed removal rate is expected because the same composition is expected to yield the same results. In view of this, burden is upon applicant to show that this combination would not result in the claimed removal rate and/or unexpected results for the claimed composition commensurate in

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scope with said composition. Applicant has not clearly shown any evidence that would establish criticality. With respect to the second independent claim (first claim number 32 as defined in the amended version of the claims), applicant argues that since Pasqualoni uses an oxidizer, it is outside the scope of the instant claims (consisting essentially of). The examiner disagrees for the same reasons defined above (response to Streinz/Moeggenborg arguments).

With respect to the rejection based on Mirsa/Moeggenborg, applicant argues that the proposed combination would not result in the claimed high removal rate, as claimed in claims 19 and 21. Applicant states that Mirsa does not teach any removal rates and the examples of Moeggenborg teach medium removal rates. First, a reference is not limited to the disclosure in the examples but rather can be used for all it realistically teaches and second, the examiner is aware that Mirsa might not teach removal rates, however, this does not preclude the combination, as defined above, from have the claimed removal rates for the reasons defined below. The examiner has clearly made a prima facie case of obvious for the combination of components and stated that since the composition is the same and is used to polish the same material (dielectric), the claimed removal rate is expected because the same composition is expected to yield the same results. In view of this, burden is upon applicant to show that this combination would not result in the claimed removal rate and/or unexpected results for the claimed composition commensurate in scope with said composition. Applicant has not clearly shown any evidence that would establish criticality. With respect to the second independent claim (first claim number 32 as defined in the amended version of the claims), applicant argues that since Mirsa uses an oxidizer, it is outside the scope of the instant claims (consisting

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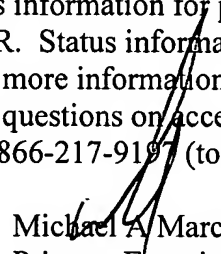
essentially of). The examiner disagrees for the same reasons defined above (response to Streinz/Moeggenborg arguments).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Marcheschi whose telephone number is (571) 272-1374. The examiner can normally be reached on M-F (8:00-5:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

2/07
MM


Michael A. Marcheschi
Primary Examiner
Art Unit 1755